

Remarks

Claims 1-5 are pending in the application. Claims 1-4 has been amended. Claim 5 has been cancelled. Reconsideration and re-examination of the application is respectfully requested.

1. The Examiner has objected to claims 1-3 for having undue scope. Specifically, the Examiner stated that claims 1-3 appear to read on an electrolysis cathode as disclosed in U.S. Patent No. 4,536,259 issued to Oda et al. While the present disclosure would enable one skilled in the art to make a cathode-sleeve substrate including the disclosed alloy, there is no suggestion in the present disclosure that the subject alloy would be suitable for an electrolysis cathode.

Claims 1-3 have been amended to limit the scope of the claims to an electron emitting cathode in a cathode ray tube. In view of this amendment, removal of the objection to claims 1-3 is respectfully requested.

2. The Examiner has rejected claims 1 and 2 under 35 U.S.C. 102(b) as being anticipated by Kunz (U.S. Patent No. 4,376,009).

With regard to claim 1, the Examiner stated that Kunz discloses an alloy including 94.9 weight percent nickel and up to about 0.05 weight percent magnesium. With regard to claim 2, the Examiner stated that Kunz discloses a weight percentage of aluminum of zero. The Examiner, therefore, concluded that Kunz teaches all the elements of claims 1 and 2.

Claim 1 has been amended to claim a cathode comprising a basis metal formed of a metal alloy, said alloy including mainly nickel and a weight concentration C_{Mg} of Magnesium (Mg) which is between 0.01% and 0.1%. Kunz teaches a method for selectively etching an

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integral or unitary cathode substrate and support. A blank 11 is deep-drawn from a bi-metal strip so as to provide a cup-shaped structure with a cathode-substrate-nickel-alloy layer 15 consisting essentially of at least 94.90-weight-percent nickel and up to about 0.05-weight-percent silicon and magnesium. The claimed invention teaches a basis metal formed of a metal alloy having a weight concentration C_{Mg} of Magnesium (Mg) which is between 0.01% and 0.1%. Kunz does not teach a weight concentration C_{Mg} of solely magnesium between 0.01% and 0.1%, but teaches a weight-percent of magnesium and silicon up to about 0.05%. The weight-percent of magnesium required by Kunz, therefore, could be less than 0.01%. Further, Kunz does not teach the blank 11 as part of a cathode in a cathode ray tube. As such, Kunz does not teach all of the elements of amended claim 1. Removal of the rejection of claim 1 under 35 U.S.C. 102(b) is respectfully requested.

Claim 2 depends from independent claim 1. As previously discussed, Kunz does not teach all of the elements of claim 1. Because Kunz does not teach all of the elements of claim 1, Kunz does not teach all of the elements of claim 2. Further, to satisfy the equation such that the weight concentration C_{Al} of aluminum is zero, the weight concentration C_{Mg} of magnesium would have to be 0.1%. Kunz teaches a weight-percent of magnesium and silicon up to about 0.05%. Kunz, therefore, does not teach a weight concentration C_{Mg} of magnesium that would satisfy a weight concentration C_{Al} of aluminum of zero. Removal of the rejection of claim 2 under 35 U.S.C. 102(b) is respectfully requested.

3. The Examiner has rejected claims 2 and 3 under 35 U.S.C. 103(a) as being unpatentable over Kunz (U.S. Patent No. 4,376,009) in view of Misumi (U.S. Patent No. 4,636,681). The Examiner stated that Kunz discloses all the elements as previously described with regard to claim 1, but does not disclose an alloy including aluminum. The Examiner

further stated that Misumi discloses an alloy including up to about 0.05 weight percent magnesium and/or aluminum. Because Misumi discloses aluminum as a recognized equivalent for magnesium, the Examiner concluded that it would have been obvious to replace a portion of the magnesium in the alloy, as disclosed by Kunz, with aluminum, as disclosed by Misumi because the two metals are art recognized equivalents for the purpose of a reducing agent. In addition, with regard to claim 3, the limitation "after the cathode has been activated, the percentage of the surface of the alloy below the emissive layer of the cathode covered by stable crystallites is less than or equal to 3%" does not have any patentable weight. It does not have patentable weight because the claim is directed to a metal alloy and not to a cathode, and the limitation is directed to an intended use for the alloy that does not result in any structural difference in the alloy.

a. The combination of Kunz in view of Misumi does not teach or suggest all of the claim limitations of claim 2. Claim 2 depends from independent claim 1. As previously discussed, Kunz does not teach all of the claim limitations of claim 1. Because Kunz does not teach all of the claim limitations of claim 1, except an alloy including aluminum, Kunz does not teach all of the claim limitations of claim 2. Additionally, neither Kunz nor Misumi teach the problem or the source of the problem solved by the Applicant's invention. The Applicant's invention teaches a metal alloy wherein the amount of surface crystallites is minimized as a function of the aluminum content and the magnesium content. The optimal amount of weight concentration of magnesium being between 0.01% and 0.1%. The optimal amount of weight concentration of aluminum being calculated from the magnesium content. Kunz merely recites a cathode-substrate alloy having a total weight-percent of up to about 0.5% silicon and magnesium. Misumi merely recites a base having a total weight percent of various reducing agents up to 0.5%. The reducing agents may include any of magnesium,

zirconium, silicon, or aluminum. Neither Misumi nor Kunz, therefore, teaches optimizing the electron emitting performance of a cathode in a cathode ray tube by optimizing the relationship of the weight percentage of aluminum and magnesium in the metal alloy. Because the combination of Kunz in view of Misumi neither teaches nor suggests all of the elements of claim 2, or teaches the problem or the source of the problem solved by the Applicant's invention, removal of the rejection of claim 2 under 35 U.S.C. 103(a) is respectfully requested.

b. Claim 3 has been amended to claim a cathode and state that said alloy also contains a weight concentration C_{Al} of aluminum such that, after the cathode has been activated, the percentage of the surface of the alloy below an emissive layer of the cathode covered by stable crystallites is less than or equal to 3%. Claim 3 depends from independent claim 1. As previously discussed, Kunz does not teach all of the claim limitations of claim 1. Because Kunz does not teach all of the claim limitations of claim 1, except an alloy including aluminum, Kunz does not teach all of the claim limitations of claim 3. Additionally, neither Kunz nor Misumi teach the problem or the source of the problem solved by the Applicant's invention. The Applicant's invention teaches a metal alloy wherein the amount of surface crystallites is minimized as a function of the aluminum content and the magnesium content. Specifically, that the percentage of the metal alloy covered by the surface crystallites is less than or equal to 3% such that there is good adhesion of an oxide layer to the basis metal. Kunz merely recites a cathode-substrate alloy having a total weight-percent of up to about 0.5% silicon and magnesium. Misumi merely recites a base having a total weight percent of various reducing agents up to 0.5%. The reducing agents may include any of magnesium, zirconium, silicon, or aluminum. Neither Misumi nor Kunz, therefore, teaches optimizing the electron emitting performance of a cathode in a cathode ray tube by optimizing the

relationship of the weight percentage of aluminum and magnesium in the metal alloy by having 3% or less of the metal alloy covered by the surface crystallites. Because the combination of Kunz in view of Misumi neither teaches nor suggests all of the elements of claim 3, or teaches the problem or the source of the problem solved by the Applicant's invention, removal of the rejection of claim 2 under 35 U.S.C. 103(a) is respectfully requested.

4. The Examiner has rejected claims 4 and 5 under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (U.S. Patent No. 4,924,197) in view of Kunz (U.S. Patent No. 4,376,009). The Examiner stated that Watanabe et al. discloses a CRT including a cathode with an emissive layer 2 of alkaline earth metal oxides on a sleeve 1. Watanabe et al. is silent as to the composition of the sleeve. The Examiner further stated that Kunz discloses a cathode substrate alloy as previously described with regard to claim 1. The Examiner, therefore, concluded that it would have been obvious to include the alloy as disclosed by Kunz in the cathode or CRT as disclosed by Watanabe et al., because the alloy is typically used for making cathode substrates.

Claim 4 has been amended to state that said basis metal includes an emissive part consisting of a layer of alkaline-earth oxides to reflect proper antecedent basis from amended claim 1. Claim 5 has been cancelled for having subject matter now included in amended claim 1. Claim 4 depends from independent claim 1. As previously discussed, Kunz does not teach all of the claim limitations of claim 1. Because Kunz does not teach all of the claim limitations of claim 1, except an alloy including aluminum, Kunz does not teach all of the claim limitations of claim 4. Removal of the rejection of claim 4 under 35 U.S.C. 103(a) is respectfully requested.

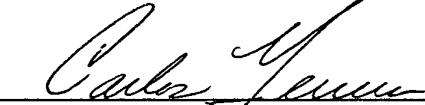
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In view of the amendments and arguments presented herein, the application is considered to be in condition for allowance. Reconsideration and passage to issue is respectfully requested.

Please charge any additional fees associated with this application to Deposit Order Account No. 07-0832.

Respectfully submitted,

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